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PENSOFT

Cavernicola pilosa Barber, 1937 (Hemiptera, Reduviidae, Triatominae): first record in Amazonas state, Brazil

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Abstract

Cavernicola pilosa Barber, 1937 is a wild triatomine species that generally lives in caves but has been found invading dwellings. It feeds mostly on bat blood. This vector has a wide geographical distribution throughout Central and South America, including Brazil, Ecuador, Colombia, French Guiana, Panamá, Peru, and Venezuela. In Brazil, *C. pilosa* occurs in the states of Bahia, Pará, Tocantins, Espírito Santo, Goiás, Mato Grosso do Sul, Minas Gerais, Paraná, and Maranhão. We report for the first time its presence in Amazonas state, Brazil.

Keywords

Chagas disease, triatomines, tribe Cavernicolini.

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Introduction

Insects of the subfamily Triatominae are vectors of the infectious Chagas disease. Transmission occurs mainly during the blood meal and, subsequently, defecation at the site of the bite with parasitic forms (Coura 2015). The subfamily Triatominae is composed of 154 described species which are assigned to five tribes and 19 genera (Dorn et al. 2018; Lima-Cordon et al. 2019; Poinar 2019). Considering that the tribe Cavernicolini and genus *Cavernicola* Barber, 1937 were diagnosed before the description of the second species, Oliveira et al. (2007) redescribed the tribe and genus based on morphological and morphometric features. The genus *Cavernicola* is considered a cave-specialized triatomine, with only two species. *Cavernicola pilosa* Barber, 1937 was described from seven adult specimens and five nymphs collected in caves occupied by large numbers of bats in Panama (Barber 1937). The second species, *Cavernicola lenti* Barrett & Arias, 1985, was described from adults, nymphs, and eggs collected inside a large, live, hollow tree in Amazonas state, Brazil, where it was associated with *Rhipidomys* sp. (Rodentia) but still able to feed from other vertebrates in the laboratory (Barrett and Arias 1985). *Cavernicola lenti* has also been found invading urban areas and households (Silva et al. 1992). *Cavernicola*

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pilosa mainly inhabits caves, feeding on bat blood (Lent and Wygodzinsky 1979), and it possibly disperses passively in bat hair (Oliveira et al. 2008). This species has already been reported in Brazil in the states of Pará, Tocantins, Bahia, Espírito Santo, Goiás, Mato Grosso do Sul, Minas Gerais, Paraná, and Maranhão (Lent and Jurberg 1969; Galvão et al. 2003; Oliveira et al. 2007, 2008; Gil-Santana et al. 2014). A previous erroneous occurrence of this species in the state of Amazonas was cited by Gomes and Pereira (1977), who attributed this distribution to Neiva and Lent (1941). We read the entire paper and did not find this distribution cited in the text. Certainly, for this reason, the record was later omitted in the reviews by Lent and Wygozinsky (1979) and Galvão et al. (2003). Here, we confirm for the first time its presence in the Amazonas state, Brazil, where it was found in the Floresta Nacional do Aripuanã and Reserva Biológica do Manicoré, where sylvatic populations of *C. pilosa* are in close proximity to the human population.

Methods

The municipality of Novo Aripuanã, in Amazonas state, is part of the North Region of Brazil and belongs to the microregion of Madeira. The human population of this municipality is, according to estimates, 25,237 inhabitants (IBGE 2018). In ecological terms, Novo Aripuanã is in the ecotone between the Cerrado and Amazonian biomes in an area bordered by intense anthropic pressure. The Aripuanã river basin has an area of 146,300 km² in the states of Amazonas, Mato Grosso, and Rondônia, integrating the Madeira River basin and composing the southeastern region of the Amazon basin. Some of these protected areas constitute the Apuí Mosaic, a continuous set of conservation units that form the Ecological Corridor of the South-Amazon Ecotones. The area has a humid tropical climate, with no cold season, an average monthly temperature of 18 °C, and a very dry season that coincides with winter; at least one month has rainfall less than 60 mm. In 2011, during a routine inspection conducted by "Fundação de Vigilância em Saúde (FVS-AM)", the triatomine specimen was collected from a dry tree trunk deposited on the ground in peridomestic habitat of Vila do Carmo, Novo Aripuanã, Amazonas, Brazil. The specimen was collected and deposited in the "Fundação de Vigilância em Saúde (FVS-AM)". In 2019, the specimen was studied and identified as *Cavernicola pilosa*. The identification was made using the dichotomous keys by Lent and Wygodzinsky (1979), Oliveira et al. (2007), and Galvão (2014).

Results

New record. BRAZIL • 1 ♂, total length not exceeding 11 mm; Amazonas state, municipality of Novo Aripuanã, Vila do Carmo, 07°32′46″S, 060°42′12″W (Fig. 1); 4 Aug. 2011; Fundação de Vigilância em Saúde (FVS-AM); deposited in FVS-AM.

Identification. Cavernicolini have an ovoid head, which is strongly convex dorsally in the lateral view; genae are less conspicuous, not surpassing level of apex of clypeus; antenniferous tubercles are inserted close to anterior border of eyes, without setiferous lateral process apically; ocelli are placed in or closely behind inter-ocular sulcus, the latter strongly backwardly curved and almost attaining level of posterior border of head (Fig. 2A). *Cavernicola pilosa* can be diagnosed in having anteocular region slightly longer or same length as postocular region, the clypeus convex, with an ampule-shaped constriction medially, and the pronotum wider than long and smaller than head. The scutellum is triangular, with two raised cristae laterally, just before apex; the apical process is very small, rounded apically, and almost perpendicular to abdominal dorsum. The corium is smoky chestnut-colored, with two dark-yellow markings with indistinct borders, venation is indistinct, and sparse, long hairs cover it (Oliveira et al. 2007) (Fig. 2B).

Discussion

We extend the geographical distribution of *Cavernicola pilosa* to Amazonas state. This vector has a wide

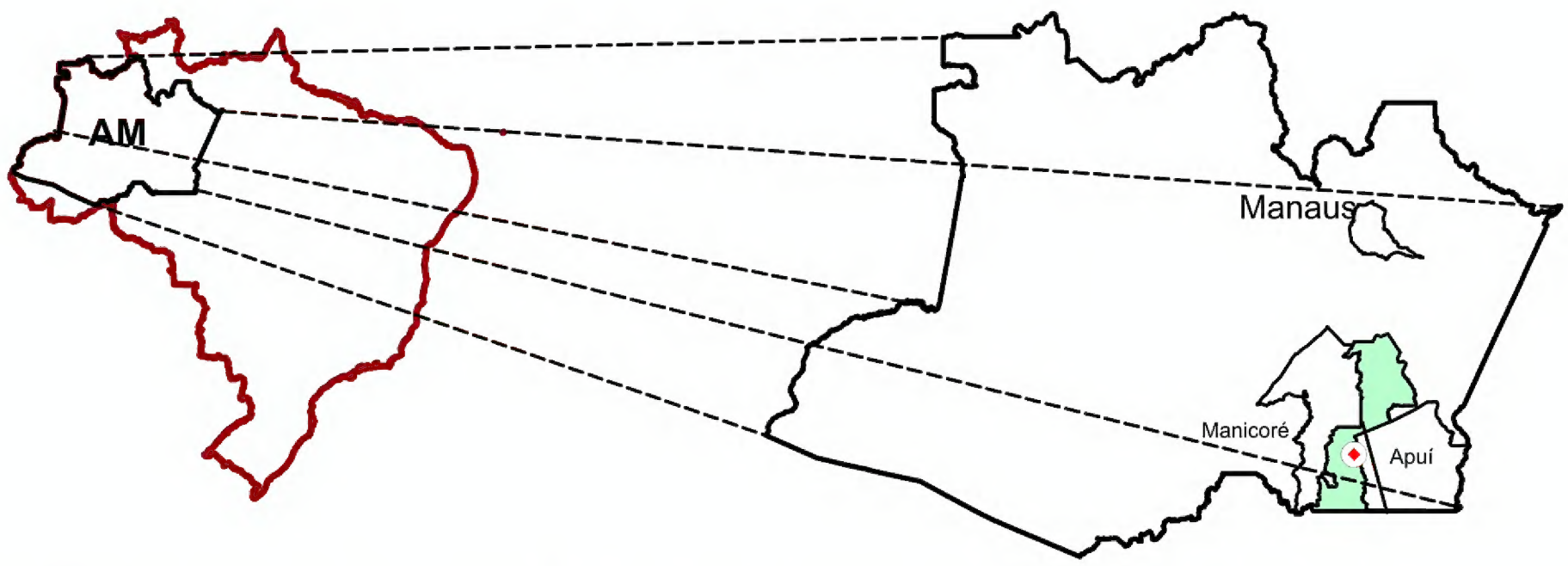

Figure 1. Community of Vila do Carmo (07°32′46″S, 060°42′12″W), in Novo Aripuanã municipality, Amazonas state, Brazil.

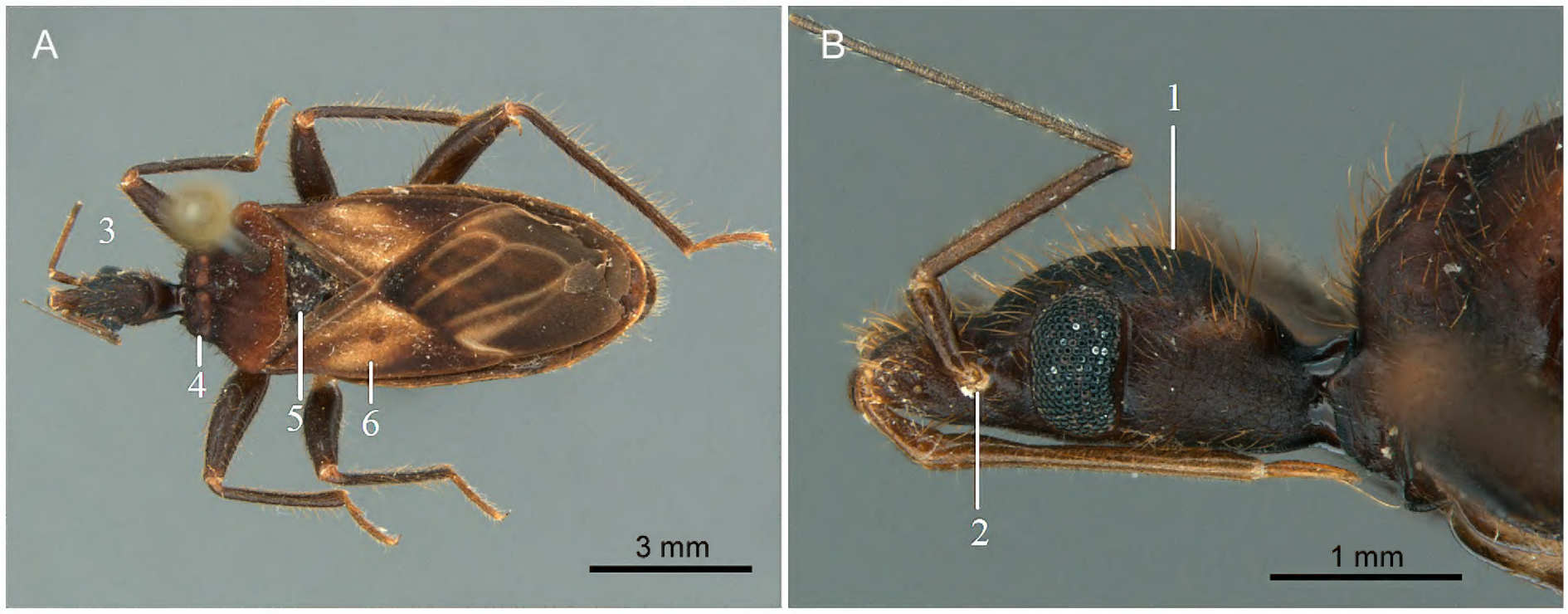

Figure 2. *Cavernicola pilosa* found in Amazonas State. **A.** Dorsal view. **B.** Lateral view of the head. The morphological criteria for identification: 1 = head ovoid, strongly convex dorsally in lateral view, 2 = Antenniferous tubercles inserted close to anterior border of eyes, 3 = anteocular region slightly longer or same length as postocular region, 4 = pronotum wider than long, smaller than head, 5 = scutellum triangular, with two raised cristae laterally, just before apex, apical process very small, rounded apically, almost perpendicular to abdominal dorsum, 6 = corium smoky chestnut, with 2 dark yellow markings with indistinct borders.

geographical distribution, including much of the Amazon biome, and is found in Brazil (Bahia, Espírito Santo, Goiás, Minas Gerais, Mato Grosso do Sul, Pará, Paraná, Tocantins, Maranhão, and now in Amazonas), Colombia (Cundinamarca, Meta, Tolima, and Valle), Panama, Peru (Loreto), Venezuela (Cojedes, Portuguesa, Táchira, and Lara), Ecuador, and French Guiana (Galvão et al. 2003; Berenger et al. 2009; Oliveira et al. 2007, 2008; Gil-Santana et al. 2014). The main morphological diagnostic characters between *C. pilosa* and *C. lenti* are: head in dorsal view fusiform in *C. pilosa* and globular in *C. lenti*, anteocular region same length or somewhat longer than postocular in *C. pilosa* but shorter than postocular in *C. lenti*. Oliveira et al (2007) provided a detailed diagnosis of both species. We examined the type specimen deposited at CTIOC/Fiocruz (Fig. 3) and confirmed that our specimen is *C. pilosa*.

Several triatomine species have been found feeding on bats in natural conditions. Pinto and Bento (1986) found *Triatoma brasiliensis* Neiva, 1911 associated with and naturally infected by, a colony of *Phyllostomus hastatus hastatus* Pallas, 1767. Another triatomine, *Panstrongylus geniculatus* Latreille, 1811, was found infected with *Trypanosoma cruzi* Chagas, 1909 in Cueva del Guano, a cave in Paraguaná Peninsula, Venezuela (Molinari et al. 2007). *Cavernicola pilosa* is found associated with bats inhabiting caves or tree cavities in tropical regions, and there are reports of *C. pilosa* in human dwellings, where it is always associated with bats (Marinkelle 1966; Gomes and Pereira 1977; Lent and Wygodzinsky 1979; Oliveira et al. 2008). Novo Aripuanã, Amazonas, presents a different ecological context, as it is in contact with the Floresta Nacional do Aripuanã and Reserva biológica do Manicoré, which put sylvatic populations of *C. pilosa*, a potential vector of Chagas disease, in close proximity to the human population. With the replacement of wild habitats with urban areas, the occurrence of sylvatic species that sporadically invade human dwellings is a major difficulty for vector control (Silva et al. 1992; Ribeiro et al. 2015).

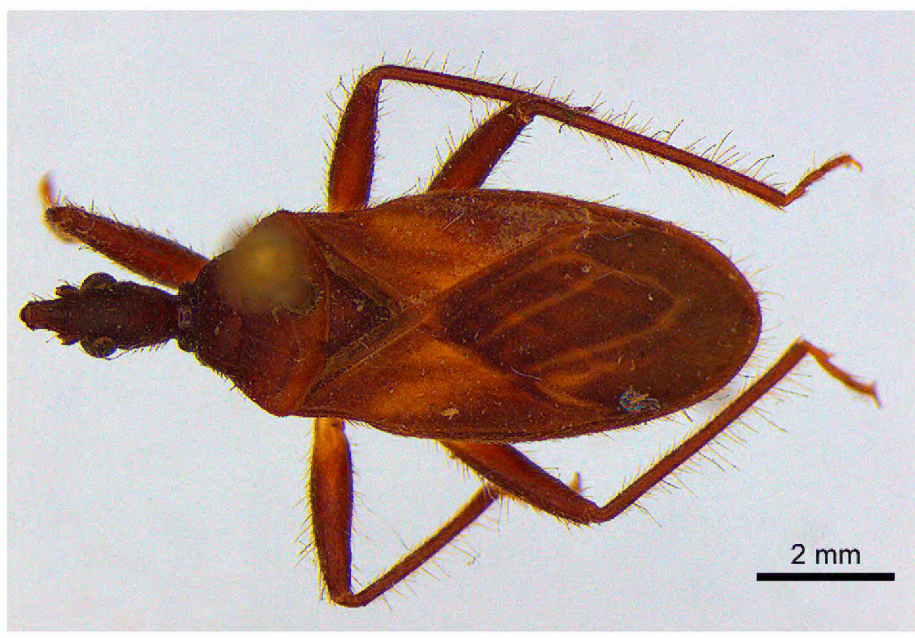

Figure 3. Type specimen of *Cavernicola pilosa* deposited in the Triatominae Collection at the Oswaldo Cruz Institute (CTIOC), Rio de Janeiro, Brazil.

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Authors' Contributions

EBN and ECSC conducted the fieldwork; VFP and CG contributed to the preparation of the manuscript and reviewed the whole text; ESS studied the specimen and reviewed the whole text.

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